It is that which has been followed in the double capacity of geometer and physicist by Sir George Stokes, to whom we are about to pay so touching and deserved a homage. All his beautiful researches, both in hydrodynamics as well as in theoretical and practical optics, relate precisely to those transformations which various media impose on waves which traverse them.

In the many phenomena which he has discovered or analysed, movements of fluids, diffraction, interference, fluorescence, Röntgen rays, the dominant idea which I pointed out to you is always visible; it is that which makes the harmonious unity of the scientific life of Sir George Stokes.

The University of Cambridge may be proud of the Lucasian Chair of Mathematical Physics, because from Sir Isaac Newton up to Sir George Stokes it has contributed a glorious part towards the progress of Natural Philosophy! A. CORNU.

NOTES.

WE are glad to be able to publish this week a translation of the Rede Lecture delivered at Cambridge by Prof. Alfred Cornu, professor of experimental physics in the École polytechnique, Paris, and a Foreign Member of the Royal Society, on the occasion of the recent celebration of the jubilee of Sir George Stokes as Lucasian professor of mathematical physics. Prof. Cornu delivered the lecture in French, and we are indebted to him for the translation of his brilliant discourse, which immediately precedes this Note.

AN interesting gathering took place at the Star and Garter Hotel, Richmond, on Thursday last, when a number of friends joined with the members of the Physiological Society in giving a congratulatory dinner to Sir John Burdon-Sanderson, Bart., F.R.S., and Prof. Michael Foster, K.C.B., Sec.R.S., in honour of Her Majesty's recent recognition of the great services they have rendered to science. The chair was taken by Prof. Schäfer, F.R.S., and the friends who assembled to support him in doing honour to the distinguished guests numbered considerably over a hundred. The principal speeches of the evening were made by the chairman, by Sir John Burdon-Sanderson, and by Prof. Michael Foster, all of whom were able to give interesting reminiscences of the early days of physiology in England, and of the great difficulties which used to be thrown in the way of those who wished to study the subject. Owing to the exigencies of the various examinations now in progress, many physiologists were unable to be present in the earlier part of the evening, but the great interest taken in the proceedings was shown by the long journeys undertaken by several in order that they might take part at the dinner.

THE special number of the *Atti*, containing the report of the anniversary meeting of the Reale Accademia dei Lincei, announces the annual awards of prizes. The Royal prize for astronomy for 1896 remains unawarded. The Royal prize for philology and languages is divided equally between Prof. Pio Rajna, for his critical edition of Dante's "De Vulgari Eloquentia," and Prof. Claudio Giacomino, for his studies on the Basque language. The prize for history and geography is unawarded, and the same is true of a prize offered for 1898 for perfecting the theory of motion of a rigid body. The Ministerial prize of 3400 lire for history for 1898 is divided, a prize of 1700 lire being awarded to Prof. Gaetano Salvemini, and smaller awards being made to Profs. Alberto Pirro, Niccolò Rodolico, and Michele Rosi. Of the Ministerial prize of 3400 lire for mathematics for 1898, a prize of 2000 lire is awarded to Prof. Ettore Bortolotti, and awards of 700 lire each are made to Profs. Federico Amodeo and Francesco Palatini. The adjudicators state that the works of Prof. Pirondini would have gained an award had not some of them received recognition on a previous occasion. The adjudicators of the Ministerial prize for philosophical and social sciences for 1897 award 500 lire each to Profs. Albino Nagy, Luigi Ambrosi, and Tarozzi. The Mantellini prize is unawarded. Of the Santoro prize for electro-technics one half is awarded to Signor R. Arnò, for his share in the joint invention with the late Prof. G. Ferraris of a new transformer. The Santoro prize for chemistry as applied to agriculture is unawarded, and from the Carpi prize for mathematical physics for 1897–8 a sum of 500 lire is awarded to Signor C. Canovetti, for his papers on the direction of aerostats and on the resistance of the air.

IN connection with the preparation of argon, a good deal of attention has been paid to the absorption of nitrogen by metals. Prof. Ramsay, it will be remembered, used magnesium. Later, lithium was proposed by Ouvrard, and a mixture of lime and magnesium by Maquenne. The subject has recently been systematically investigated by Dr. Hempel, who finds that a mixture of calcium magnesium and sodium is very much more effective than the agents just named. The mixture is obtained by using 1 gramme of finely divided magnesium, 5 grammes coarsely powdered lime, and 0·25 grammes sodium. In a comparative time experiment the rates of absorption of nitrogen by magnesium, lithium, lime-magnesium, and lime-magnesium-sodium were in the ratio 1, 5, 8 and 20.

TO commemorate the completion of the twenty-five years of active work as a teacher of physiology of Prof. Purser, of Trinity College, Dublin, a movement is on foot among the professor's former pupils to raise funds for the bestowment annually of a "Purser Medal" to the candidate who, in the half M.B. examination, shows the highest proficiency in physiology and histology. Subscriptions, which are not to exceed a guinea, should be forwarded to the honorary treasurer, Dr. W. J. Houghton, 30 Lower Fitzwilliam Street, Dublin.

DR. MAXWELL T. MASTERS, F.R.S., has been made an officer of the Order of Leopold by the King of the Belgians.

THE Neill Prize for 1895–98 has been awarded to Prof. J. Cossar Ewart, F.R.S.. by the Royal Society, Edinburgh, for his experiments and investigations bearing on the theory of heredity.

THE King of Sweden has conferred upon Mr. E. P. Martin, past-President of the Iron and Steel Institute, a Knight-commandership of the Royal Order of Wasa, and upon Mr. Bennett H. Brough, present Secretary of the Institute, a Knighthood of the same Order.

A DEPUTATION from the Iron and Steel Institute, consisting of Sir W. C. Roberts-Austen, K.C.B., F.R.S., President, Sir Lowthian Bell, Bart., F.R.S, Mr. E. P. Martin, past-Presidents, and Mr. Bennett H. Brough, Secretary, waited upon the Queen last week for the purpose of presenting to Her Majesty an illuminated address and the Bessemer Gold Medal, in commemoration of the great progress made in the iron and steel trade during the Queen's reign.

THE Meteorological Council have appointed Captain Campbell M. Hepworth, R.N.R., to fill the post of Marine Superintendent in succession to the late Mr. Baillie. Captain Hepworth has been an observer for the Meteorological Office for twenty-three years, and almost all of his logs have been classed "excellent."

A MEETING of the Aeronautical Society will be held at the Society of Arts to-morrow (July 28) at eight p.m.

THE summer meeting of the Institution of Mechanical Engineers was opened at Plymouth on Tuesday. In connection

with the meeting the Freedom of the Borough of Devonport has been presented to the president, Sir W. H. White, K.C.B., F.R.S.

THE thirty-sixth annual conference of the British Pharmaceutical Society of Great Britain was opened on Tuesday at Plymouth, the president, Mr. J. C. C. Payne, Belfast, being in the chair. The executive committee reported that the total membership was 1303. A number of papers on technical subjects were read and discussed.

THE Japanese Government have, it is stated, decided to make vaccination compulsory in Japan. All children must be vaccinated before the age of ten months. The first re-vaccination is to take place at six, and the second at twelve years of age.

MR. C. J. LYONS, writing in the U.S. *Weather Review*, from Honolulu, points out that most prominent volcanic outbursts on Hawaii have occurred at times of minimum sun-spots; so that, if the connection is real, a great lava flow may be expected at some time between now and 1901. Whether the years of maximum sun-spots are coincident with the years of no eruption does not appear to have been examined by Mr. Lyons.

A REUTER telegram of July 21 from New York states that the crater on the peak of Mauna Loa, Hawaii, burst into violent eruption on the 4th inst. Lava flowed down in three streams, one going towards Hilo and the two others in the direction of the sea, threatening the coffee plantations and the sugar lands.

A SPECIMEN of the egg of the Great Auk was sold by auction at Stevens's Rooms last week, and, although slightly cracked, realised the sum of 300 guineas, which equals the amount paid for the specimen sold at the same place in 1894. The egg just sold was figured in the *Memoirs* of the Société Zoologique de France in 1888, and, with additional notes on its history, it appeared in the *Bulletin* of the Société in 1891.

THE *Astrophysical Journal* for June states that a conference of astronomers and astrophysicists will, on the invitation of Prof. Hale, be held at the Yerkes Observatory, Williams Bay, Wis., U.S.A., from September 6 to 8 next. In its plan and scope the conference will be similar to those held in 1897 and 1898 at Williams Bay and Cambridge, Mass., respectively. The committee charged with perfecting a plan for the organisation of a permanent society of astronomers and astrophysicists, to have charge of future conferences, will present its report.

ACCORDING to the *Athenaeum*, Dr. Sven Hedin has set out upon his new journey of exploration in Central Asia, and expects to be absent for about two and a half years, principally in East Turkestan and the northern part of Tibet. The Russian Government has accorded him free passage on the Russian railway and free transmission of his very extensive equipment. For his Asiatic travel, as in his earlier journeys, a guard of Cossacks is to be placed at his disposal upon his application where necessary.

THE annual meeting of the British Medical Association will be held at Portsmouth next week. The proceedings will commence on Tuesday, August 1, when Dr. J. Ward Cousins, Southsea, will deliver the presidential address in the town-hall. On Wednesday and following days the sections will meet in the mornings and afternoons. On Wednesday evening a *soirée*, invitations to which will be issued by the president, will be held in the town-hall, and on Thursday the annual dinner of the Association will be held in the same building, to be followed by a reception organised by the ladies' committee. On Friday night Alderman T. Scott Foster will give a ball at the town-hall. The meeting will be brought to a conclusion on Saturday evening, August 5.

WE learn from *Science* that Clark University, Worcester, Massachusetts, has just celebrated its decennial in a manner worthy of a university devoted to the advancement of science. The following lectures were delivered in connection with the celebration: Prof. Ludwig Boltzmann, of the University of Vienna, on the "Principles and Fundamental Equations of Mechanics"; Prof. Picard, of the University of Paris, on "Differential Equations," and on "Analytical Functions"; Prof. Angelo Mosso, of the University of Turin, on "The Relation between Muscular Exercise and the Development of Mental Power," and on "Bodily Disturbances accompanying the Emotions"; Prof. Santiago Ramon y Cajal, of the University of Madrid, on the "Structure of the Visual Cortex of the Human Brain," and Prof. August Forel, of Zürich, on "Hypnotism," and on "Arts."

AN International Congress of Physics, to be held during the Paris Exposition next year, is being organised by a Committee of the Société française de Physique. The congress will commence on August 6, 1900, and will last a week. Though a number of special congresses are being arranged, it is thought that a congress having for its object the discussion of fundamental questions of physical science will be of interest to all physicists. Among the subjects to be dealt with in reports and discussions are the definition of certain units, such as pressure, scale of hardness, quantity of heat, photometric values, constants of saccharimetry, spectrum scale, and electrical units not yet defined; bibliography of physics; and national laboratories. There will also be visits to exhibits of scientific interest in the Exposition, to laboratories and to manufactories; and conferences on some new subjects, to be announced later, will be arranged. The president of the organising committee is Prof. Cornu; vice-president, M. Cailletet; and secretaries, M. C. E. Guillaume (au Pavillon de Breteuil, Sèvres, Seine-et-Oise) and M. Lucien Poincaré (105 *bis* boulevard Raspail, Paris), the former being the secretary for foreign members, and the latter for France.

FROM the *Bulletin de la Société d'Encouragement* we learn that an International Congress of Applied Mechanics has been organised for 1900 in connection with the Universal Exhibition. A draft programme has already been drawn up, and the subjects for discussion include mechanical laboratories, mechanical applications of electricity, high-speed steam engines, the mechanics of motor cars and implements. The Congress will open on July 19, 1900, and will last a week. Full particulars are obtainable from the Secretary of the Commission, 44 rue de Rennes, Paris.

THE Berlin correspondent of the *Lancet* gives a few particulars concerning the institution for the study of tropical diseases, shortly to be erected in Hamburg by the Government. It was the wish of Prof. Koch and the medical faculty that the institution should find a home in Berlin, in connection with, and as a department of, the Institution for Infectious Diseases. The Government, however, was of opinion that Hamburg would be preferable because a large number of patients coming from tropical climates and suffering from the specific diseases of the tropics are received into the Hamburg hospitals. In this way the new institution will have ample material for study, whilst if the institution were established in Berlin the patients would have to be conveyed from Hamburg and other seaports to the metropolis, a proceeding which would eventually be prejudicial to them. It is neither decided yet when the institution will be opened nor who will be appointed director. Probably one of the Colonial medical officers will be placed in charge.

ACCORDING to the *Journal of Applied Microscopy*, it is proposed to hold a bryological meeting at Columbus, Ohio, during the session of the American Association for the Advancement of Science at that place. It is intended to present a series of papers, illustrated by specimens, photographs, microscopical slides, books and pamphlets, and to show the work done by leading workers on the subject. In addition to these will be shown collections of specimens, macroscopic and microscopic, illustrating the monographic work of living American students, and foreign students who have worked on North American mosses will be asked to co-operate.

THE weather was very warm and dry last week, and the thermometer reached a higher point than on any previous occasion this summer. At Greenwich there were five consecutive days on which the shade temperature exceeded 80°, and on Wednesday and Friday the thermometer exceeded 88°. In some of the London suburbs the air temperature was highest on Friday, the 21st, the thermometer in Stevenson's screen touching 90° in the south of the metropolis. The highest temperature in the sun's rays at Greenwich occurred on Wednesday, when the thermometer registered 158°, which is higher than any reading during the previous three years. A sharp thunderstorm passed over the metropolis on Sunday morning, and the accompanying rainfall was generally heavy. At Greenwich the fall of rain exceeded three-quarters of an inch, at Westminster an inch was measured, while at Brixton the rain amounted to half an inch, and in some localities it was even less. A cooler air has spread over the British Islands during the last few days, and the general type of weather is favourable to occasional showers, so that at length the recent drought may reasonably be considered at an end.

THE United States *Monthly Weather Review* for March contains an interesting historical account of the meteorological services in Russia, and especially of the Central Physical Observatory, by Prof. Cleveland Abbe, from which we extract the following notes. This institution is dependent upon the Academy of Sciences, which was established by decree of Peter the Great, dated January 22, 1718, and its first public session was held on January 7, 1726. Prof. A. T. Kupffer, born in 1798, was the first director and organiser of the meteorological system in Russia; his first volume of "Observations météorologiques et magnétiques" was published in 1837. Subsequent issues attracted the attention of the Emperor, who ordered that the work should appear as an annual volume under the title "Annuaire magnétique et météorologique." These volumes appeared up to that for 1846, which was published in 1849. In the meantime (April 13, 1849) the Emperor established the Central Physical Observatory, and the *Annuaire* thereafter appeared under the title "Annales de l'Observatoire Physique Central," and these were published up to the time of Kupffer's death in 1865. Thereupon Prof. Kämtz (born 1801) was called from Dorpat; but he died in 1867. His successor was Prof. H. Wild, born at Zürich in 1833. He held the directorship until July 1895, when he resigned on account of health; but he still remains an honorary member of the Academy of Sciences of St. Petersburg. During his administration a great impetus was given to all meteorological and magnetical work, and the volumes of the *Annales* 1865-9 were edited by him. With the volume for 1870 a new series, under the title "Annalen des Physikalischen Observatoriums," was begun, and under his auspices the new observatory at Pavlovsk was established for the purpose of scientific investigation. The appointment of General Rykatcheff (who began working with Prof. Kämtz in 1866) as director of the meteorological service in 1895 marks a general change in the spirit of administration of affairs in Russia, where the so-called Russian element is at present predominant. The memoirs bearing on the work of the observatory are now published in Russian by the Physical Section of the Academy of Sciences; while the observations properly so-called, consisting entirely of numerical tables, are published in separate volumes under the former title of "Annales de l'Observatoire."

AN ingenious machine for printing in colours, invented by Mr. Ivan Orloff, chief engineer and manager of the Russian Government printing works at St. Petersburg, has just been set up in London, and a company has been formed to develop the use of the machine for supplying coloured illustrations for periodicals and books. In colour printing by the ordinary method the successive colours are applied one at a time as the preceding one becomes dry. By means of the Orloff machine the whole of the colours required in a picture are printed at a single turn of the cylinder. If a picture has to be printed in, say, four colours, four separate blocks are arranged around the curved surface of the cylinder. As each block passes a particular point, the roller carrying the colour required by the block is made to fall upon it by a system of cams. Each block thus receives the coloured ink intended for it in the course of a revolution of the cylinder. All the printing surfaces, as soon as they are inked, transfer their designs to a composition roller which they pass, and this in turn transfers the combined coloured design to a final surface or *forme* carried on the same cylinder as the separate blocks, and from this *forme* the fully-coloured picture is imprinted upon paper at one impression. The fundamental idea of the machine is thus to print the separate colours in succession upon a common surface, and then to use the single surface as the *forme* in the final printing. These operations go on continuously. The cylinder completes one revolution in one-twentieth of a minute, within which time every colour surface has been inked and re-inked with its proper colour, and has delivered the result to the *forme* to be impressed upon paper. The results are very effective, and the "register" is perfect, no matter how many colours are used. The machine appears to mark a distinct development of methods of printing in colours.

FROM the *Standard* of July 22 we learn that the Botanical Garden of the Vienna University can now boast of possessing specimens of a plant not to be found in any similar institution in the world, or, indeed, anywhere else in Europe or America. When the Austrian Expedition to Southern Arabia, under Prof. Dr. David Heinrich Müller, was out there last winter, Prof. Dr. Oskar Simony, son of the well-known geographer, succeeded in obtaining some incense bushes, notwithstanding that the Arabs keep the places where they grow a secret from Europeans. He brought them to Vienna alive, and they are now in full leaf.

IN the *Mathematical Gazette* for June, published under the auspices of the Mathematical Association, Prof. F. Morley communicates a note on the sphero-conic, in which he gives a simplified proof of the bifocal property. Mr. S. A. Saunders calls attention to the paradoxical questions arising from the notion of motion *at* an instant, a conception which like pressure *at* a point involves a peculiar use of the word "at." Mr. R. F. Davis contributes a paper on "Porismatic Equations"; and there is the usual collection of problems and solutions and reviews of text-books.

ONLY one article in the new part of the *Quarterly Review* is of scientific interest; it deals with the important subject of climate and colonisation. The writer of the article, after surveying a selection of the literature of the subject, and commenting on the efforts that have been or are being made towards a better understanding of tropical diseases, says: "Europeans who settle in tropical countries must not expect to remain unchanged from generation to generation. Even when there is no intercrossing, although the main features may persist for a long while, the new surroundings gradually give their own

impress. In all countries where Europeans have settled, we find they have altered in temperament, ideas, and bodily features. The change is slow at first, because fresh blood constantly streams in from the mother country and perpetuates the original characters; but as the Colony grows older the immigration falls off, and the new settlers diverge further and further from the original type. We have no reason to dread this evolution; it is the outcome of adaptation; and when we consider the splendid physical characteristics of many of the native races which inhabit tropical regions, we may fairly conclude that such adaptation will lead to the development of new types no whit inferior to the old. When we further consider that man, modifying the environment and substituting his selection for that of nature, has been able to produce and to develop endless varieties of domestic animals which would never have come into existence under natural conditions, and would soon deteriorate or perish when out of their artificial surroundings, we may certainly believe that he can, by taking thought, escape many of those detrimental influences which irresistibly modify all other organic beings."

"THE Geology of the Coolgardie Goldfield" forms the subject of the third *Bulletin* of the Geological Survey of Western Australia, and it is written by Mr. Torrington Blatchford, Assistant Government Geologist. This goldfield was discovered in 1892, and in the course of six years over two thousand tons of ore have been crushed, yielding gold at the rate of 1 oz. 3 dwt. per ton. This has been derived mainly from quartz reefs and partly from "lode formations." The amount of gold obtained from the rich alluvial deposits has not been estimated. The district of Coolgardie consists of a mass of granite on the west, succeeded by a belt of hornblendic and talcose schists, the whole being intersected by igneous dykes. Recent superficial deposits cover a large portion of the field, and at the base of these there is in places a thin stratum of "cement," an auriferous conglomerate that has not yet proved of much economic value. Gold is found in pyrites in the altered schists bordering the acid dykes, and the material is traversed by numerous small quartz leaders forming "stockworks." Though much gold has been won from this source, the lodes are small and irregular. The quartz reefs occur principally in the schists, and they dip from 60° to 80° to the east. The water-supply of the region is a source of trouble and expense. With a rainfall of only seven inches no great supply can be expected, except by storing. Shallow wells yield limited supplies up to 4000 gallons per diem at a depth of 200 feet, but a good deal of the underground water is saline. Deep boring has been unsuccessful, and supplies have in some cases to be brought from a distance. An excellent coloured geological map, on a scale of an inch to forty chains, has been prepared by Mr. Blatchford and Mr. E. L. Allhusen. This is an index to a larger map which is published separately.

IN the *Philosophical Magazine* for July the Rev. O. Fisher deals with the residual effect of a former glacial epoch upon underground temperatures. The object of the paper is to examine whether traces of the effects left by a former glacial period upon underground temperatures are sufficient in amount to enable estimates to be made, from observations in deep wells and mines, of the lapse of time since the ice disappeared from the land. The author investigates the character of the traces which a former glaciation might be expected to leave behind, the principal one being a reduction of the gradient. From observations of the temperature of a well at Wheeling, U.S.A., combined with a certain assumption, the author estimates the time of the glacial period at 34,013 years. On the whole, however, he considers that the question as to whether there is any prospect of estimating the date of the glacial epoch from underground temperatures must be answered in the negative; nevertheless, the different gradients observed in different localities may possibly be attributable in a measure to glaciation.

IN No. 8 of the series of *Frammenti concernanti la geofisica* (Rome) Dr. Folgheraiter gives an interesting account of the singular magnetic effects produced by lightning on a house at Torre Nuova, which was struck on April 8 last. The observations led the author to conclude (1) that the lightning produced a large number of singular points and zones in the masonry, it being inadmissible that the individual stones should have been so highly magnetised before construction of the walls; (2) that while doubts have hitherto existed as to the possible formation of singular points in tufa, this question has now been answered in the affirmative; (3) the alternation in the polarities of the singular points and zones, even on the same piece of tufa, is noteworthy, but no connection has yet been established between these alternations and the mode of propagation of the electricity; (4) it is now amply proved that lightning produces marked magnetisation independently of the inductive action of terrestrial magnetism.

WE have received a paper by the Rev. F. S. Chevalier, S.J., published by the Zi-ka-Wei Observatory, on the navigation of the Upper Yang-tze. The author's knowledge of the river is chiefly derived from personal observation made during a voyage as far up as Ping-shan-hsien during the winter of 1897–98. He takes a much more hopeful view of the navigability of the Upper Yang-tze than did Lieut. Dawson, whose survey is reported on in the *China Sea Directory*. The three chief obstacles, in the form of rapids, are discussed in detail, and suggestions are made with the view of making their navigation practicable. M. Chevalier has in preparation a chart of the river from I-chang to his highest point, on a scale of 1/25,000.

THE debatable question of the diffraction of Röntgen rays forms the subject of some recent experiments described by Prof. H. Haga and Dr. C. H. Wind in the *Proceedings* of the Royal Academy of Sciences of Amsterdam. In such experiments it is better, in order to obtain greater intensity, to use narrow slits than to make the distances great. As the time of exposure varied from 29 to 200 hours, the apparatus had to be mounted on a heavy freestone block supported on the central pillar of the Physical Laboratory of the University of Groningen, where the experiments were made. The diffraction slit was 3 cm. high and 14 microns at the upper end, gradually narrowing to a width of a few microns. A careful examination shows a kind of broadening out of the image corresponding to the narrowing of the slit, and this it is considered can only be attributed to diffraction of the Röntgen rays. The authors give estimates of the wave-lengths of the rays lying between 0,12 and 2,7 Ångström units, but consider that they cannot succeed in making measurements instead of estimations of the wave-length until Röntgen tubes have been produced remaining in working order as long as those used, and giving out rays of much greater energy.

THOSE responsible for the "Guide to the Museum of Eton College," seem remarkably fond of displaying an acquaintance with technical terms. Why, for instance, in giving a list of the birds of Berkshire, was it necessary to encumber it with the subheadings "Neornithes," and "Carinatæ," seeing that all existing birds come under the former category, and all those of Europe under the latter? If the number of names were reduced, and the language somewhat simplified throughout, the *Guide* would be admirable for its purpose. The museum appears to be well arranged; and it is satisfactory to note that the authorities recognise the importance of making the local collection the most prominent feature.

THE report of the Magnetical and Meteorological Observations made at the Government Observatory, Bombay, for the year 1897 has just been issued, with an appendix.

MESSRS. ISENTHAL, POTZLER, AND CO., of Mortimer Street, have sent us a supplementary list of new radiographic instruments made by them. Attention is drawn to several pieces of apparatus of recent construction.

WE have received the prospectus of the "One and All" Flower-show, an exhibition of horticultural photographs, to be held at the Crystal Palace on August 14–19, under the auspices of the "Agricultural and Horticultural Association, Limited."

IN the number of the *Biologisches Centralblatt* for July 1, Dr. R. Keller finishes his review of recent advances in vegetable physiology and botany; and Dr. G. Lindner his account of the germs of Protozoa found in rain water.

THE *Cambridge University Reporter* for June 22 contains the annual report of the Botanic Garden Syndicate for the year 1898. Several interesting and important additions have been made to the Botanic Garden during the year.

IN the numbers of the *Agricultural Gazette of New South Wales* for May and June is a continuation of M. A. O'Callaghan's series of papers on dairy bacteriology. It contains a report, with illustrations, of the bacteriological condition of a number of butters produced in the Colony.

THE Trinidad *Bulletin of Miscellaneous Information* (Botanical Department, No. 19) contains a preliminary report by Mr. G. Massee on the cacao pod disease, which is rife in the Colony. Mr. Massee ascribes it to a fungus belonging to the Peronosporeæ.

IN the *Irish Naturalist* for July is a synopsis of the Irish Characeæ, by Prof. T. Johnson; a paper on some algæ from the Antrim coast, by H. Hanna; and one on some freshwater mites from Co. Dublin, by D. Freeman.

THE *Transactions* of the Manchester Microscopical Society contains several papers which show a record of good work in microscopy:—The genitalia and radulæ of the British Hyalinia, by W. Moss; *Peripatus Leuckarti*, by F. Paulden; Scale insects, by A. T. Gillanders; *Myriothela Phrygia*, a tubularian hydroid, by W. Blackburn; and others.

WE have received a copy of Dr. Gunnar Andersson's "Studies of the Quaternary Flora of Finland" (*Bulletin de la Commission Géol. de Finlande, Helsingfors*, 1898). The work is accompanied by four excellent plates of fossil seeds, and it contains descriptions and sections of the peaty deposits from which they have been obtained.

THE current issue of the *Reliquary and Illustrated Archaeologist* contains many interesting contributions, among which may be mentioned "Antiquities of Bolsterstone and Neighbourhood," "The Instrument of the Rosary," "Two Midlothian Souterrains," "The Grinlow Barrow, Buxton," and "Notes on Archæology and Kindred Subjects." As is usual in this magazine the articles are well illustrated.

MR. ARTHUR S. EAKLE describes some andesites from the Fiji Islands (*Proc. Amer. Acad. Arts and Sciences*, May 1899). Augite-andesite seems to be the predominating rock of the islands, and it varies from types having a small amount of augite with a large amount of felspar, and with biotite as an accessory, to those in which augite is the dominant constituent, thus showing a gradation into basalt.

VOL. II., part 6, of the serial form of C. E. Groves's translation of Fresenius' "Quantitative Analysis" has now been brought out by Messrs. J. and A. Churchill; the University Correspondence College has issued its Matriculation Directory dated June 1899, in which will be found articles on the special subjects for January and June 1900; a new edition of "The Arithmetic of Electrical Measurements," by W. R. P. Hobbs, has been issued by Murby. The work has been revised and in part re-written.

THE additions to the Zoological Society's Gardens during the past week include an Anubis Baboon (*Cynocephalus anubis*, ♀) from Accra, presented by Mr. G. B. Haddon Smith; a Feline Dourocouli (*Nyctipithecus vociferans*) from Brazil, presented by Mrs. Arthur Harter; a Ring-tailed Lemur (*Lemur catta*) from Madagascar, presented by Mrs. T. Butt Miller; a Spotted Ichneumon (*Herpestes auro-punctatus*) from Malacca, presented by Mr. Geo. F. Aress; a Levaillant's Cynictis (*Cynictis penicillata*), two Bristly Ground Squirrels (*Xerus setosus*) from South Africa, presented by Mr. J. E. Matcham; a Common Duiker (*Cephalophus grimmi*, ♂) from South Africa, presented by Captain G. C. Denton; two Cormorants (*Phalacrocorax carbo*) from Scotland, presented by Mr. P. L. Pemberton; a Ground Hornbill (*Bucorvus abyssinicus*) from West Africa, presented by Mr. Geo. Hirst; two Blood-rumped Parrakeets (*Psephotus haematonotus*) from Australia, presented by Mrs. A. Chambers; a Golden Eagle (*Aquila chrysaëtus*) from Scotland, presented by Mr. H. C. Ross; three Adorned Terrapins (*Chrysemys ornata*) from Mexico, presented by Mr. C. J. Rickards; a Burchell's Zebra (*Equus burchelli*, ♀) from South Africa, two Hairy Armadillos (*Dasypus villosus*) from La Plata, a Lion Marmoset (*Midas rosalia*) from South-east Brazil, a Blue-fronted Amazon (*Chrysotis aestiva*) from South America, deposited; a Chattering Lory (*Lorius garruius*) from Moluccas, purchased; two Collared Fruit Bats (*Cynonycteris collaris*), a Burrhel Wild Sheep (*Ovis burrhel*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN AUGUST:—

August 2. 11h. 25m. Minimum of Algol (β Persei).
11. Maximum of the August meteoric shower of Perseids.
14. 8h. 25m. to 9h. 37m. Occultation of the star D.M. − 22°, 3989 (mag. 6) by the moon.
14. 9h. 4m. Transit (immersion) of Jupiter's Sat. III.
15. Illuminated portion of the disc of Venus 0·989, of Mars 0·949.
18. 10h. 28m. to 11h. 34m. Occultation of *f* Sagittarii (mag. 5·1) by the moon.
22. 9h. 21m. to 10h. 15m. Occultation of 16 Piscium (mag. 5·6) by the moon.
22. 15h. 1m. to 16h. 8m. Occultation of 19 Piscium (mag. 5·2) by the moon.
23. Outer minor axis of Saturn's outer ring = 17″·94.
25. 9h. 57m. Minimum of Algol (β Persei).
26. 12h. 5m. to 13h. 5m. Occultation of τ^2 Arietis (mag. 5·2) by the moon.
26. 12h. 55m. to 13h. 51m. Occultation of 65 Arietis (mag. 5·6) by the moon.
27. 16h. 20m. to 17h. 19m. Occultation of v^1 Tauri (mag. 4·6) by the moon.
27. 16h. 49m. to 18h. 9m. Occultation of v^2 Taur (mag. 5·5) by the moon.
29. 16h. 9m. to 17h. 25m. Occultation of η Geminorum (mag. variable) by the moon.
30. 14h. 59m. to 15h. 58m. Occultation of ζ Geminorum (mag. variable) by the moon.

TEMPEL'S COMET 1899 *c* (1873 II.).

Ephemeris for 12h. Paris Mean Time.

1899.	R.A. h. m. s.	Decl. ° ′ ″	Br.
July 27 ...	20 47 55·4 ...	−21 56 9 ...	3·698
28 ...	49 6·7 ...	22 29 17	
29 ...	50 18·0 ...	23 2 17	
30 ...	51 29·2 ...	23 35 4	
31 ...	52 40·5 ...	24 7 36 ...	3·673
Aug. 1 ...	53 51·8 ...	24 39 49	
2 ...	55 3·2 ...	25 11 40	
3 ...	20 56 14·6 ...	−25 43 7	